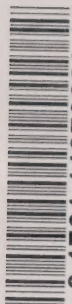


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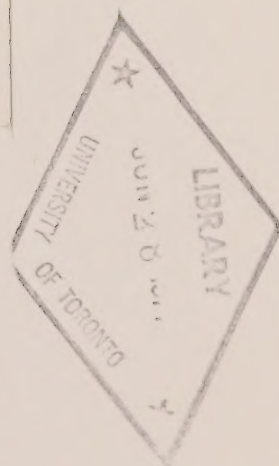
LAND USE

ISSUE PAPER #5

MARCH 1977



Ontario





Issue Paper #5

LAND USE

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Introduction

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LAND USE

"All acts by nations and people should therefore be inspired by a deep respect for the protection of the environmental resources upon which life itself depends."

INTRODUCTION

The above quotation is taken from the draft "Declaration of Principles" tabled at the United Nations Habitat Conference, June 1976. What are these environmental resources? Probably the four most fundamental and critical for the creation and support of life are - solar energy (the source of all life), air, land and water. They are by no means independent resources insofar as their central role in supporting life is concerned. However, for the purpose of this, the fifth Issue Paper to be prepared by the Commission, attention is focused primarily on land use and secondarily on water use and their respective roles in, and associations with, electric power planning.

An awareness of the physical limitations of "space-ship Earth" is, of course, vitally important in any consideration of land use, be it on a provincial or on an international scale. As is the case with several other issue areas with which the Commission is concerned (e.g., the utilization of fossil fuels; nuclear power; environmental implications of the generation and transmission of electricity; the financing of major power facilities; etc.) both "space and time" dimensions are involved. And in these areas we are not only concerned with "Ontario space"

but inevitably with "global space"; and not only with today and tomorrow, and next year, but also with a century or a millenium hence.

We are interpreting "land use", as the terms of reference of the Commission imply, in a broad sense - both pragmatically and philosophically. For instance, planning and decision-making related to several aspects of land use (e.g., agricultural, housing, electric power facilities, industrial, etc.) must clearly take into account the availability of electric power and its general impact on the environment. Some of the associated decisions are based on readily quantifiable information and are comparatively straightforward, others are based on non-quantifiable factors and some on a combination of the two kinds of information. Many of the basic land use concerns of the general public, especially those of the farming community, are necessarily of a qualitative nature and involve value judgements. During the coming months (May - October, 1977), the Commission will hear arguments relating to these, and the weighing of them will be a major task.

With the increasing complexity of industrial society the trend is for an ever-increasing proportion of the population to live in urban areas. The importance of wise land-use policies in these areas as well as in the urban-rural interfaces is indisputable. It's a well known historical fact that many of today's major metropolitan areas owe their beginnings to the fertility of the local soil, the availability of plentiful supplies of pure water and their ready accessibility - obvious examples are Toronto, Montreal, New York City, London, Vancouver etc. The

important point to bear in mind is that as population growth proliferated in the city, and continues to proliferate especially in many developing countries, the pressure of urban development on proximal fertile land also proliferates. This pressure on good agricultural land, has been exacerbated by technological change especially in the fields of transportation, communications, buildings etc., and by the development of major social and cultural institutions - schools, hospitals, universities, etc.

Because food is essential to life, a basic concern in any society must be preservation of agricultural land (i.e., "food land"). With increasing population on global, national and provincial levels, the requirement becomes even more imperative. Society's dilemma can be simply stated - on one hand the more people, the more food required, the more homes needed, the more jobs requiring more industrial and commercial space, the more institutions, the more major and minor highways etc. - all requiring more and more land in desirable places. But on the other hand much of this land may be class 1 and class 2 agricultural land and hence the growth of the urban community may inevitably give rise to less food-growing potential in the area and inevitably to less and less food being produced.

We note also insofar as electric power needs are concerned, and energy in general, that the basic land requirements are only one aspect of the land use problem, albeit an important aspect, because of the associated ramifications. For example, underlying all land use are the regional planning implications - the land needs for habitation, for agriculture, for industry, for

transportation, for recreation and for the associated services. The energy needs, especially the electricity needs, for each sector are obviously an essential input to regional, provincial and national land use plans. It is a truism that the concentration of population, and concomitantly the concentration of economic activity is determined in large measure by the availability of energy in a readily usable form.

Another important consideration is the enormous impact of technological change. Coupled with the apparent availability (until comparatively recently) of what was believed to be an assured and "endless" supply of cheap energy, technology changed the character of work in many industries and in so doing changed the character of land use.

Still another factor which must continually be borne in mind is that energy and food, in a basic sense, are virtually synonymous. Not only is food itself a key form of energy; but an increasing amount of energy (in the form of fertilizers, gasoline, oil, electricity, etc.) is required to produce it. Indeed the "input" energy may at times be greater than the output energy (the protein). It is somewhat paradoxical that while the exportation of energy (i.e., oil, natural gas and electricity) is subject to regulation by the National Energy Board, the export of food (the growing, processing, packaging, and transporting of which involves a great deal of energy) is not subject to regulation - we are not suggesting, of course, that it should be! One important corollary is that the number of agricultural and food processing workers required to feed the population, on a per capita basis, has

decreased dramatically during the past fifty years.

A note on the energy conservation implications of land use may not be out of place. Since man's environmental resources are necessarily limited (even the sun has a limited life-span, albeit of about 10 billion years of which about half have been used up), the need to protect and to conserve them is undeniable and this applies particularly to the fundamental resources referred to earlier. In general, when we talk about conservation we usually refer to the conservation of non-renewable resources, especially the non-renewable energy resources (i.e., the fossil fuels and nuclear fuels), and as we have stressed repeatedly in this series of issue papers, this is becoming increasingly important. But when we talk about renewable resources, such as the land and the fruits of the land, we are prone to forget the conservation ethic. We take for granted that renewable is renewable is renewable ...! But is it? Perhaps it was before man (about a million years ago) began to manipulate nature for his own ends (and, incidentally, sometimes improved on nature).

But the pattern has changed markedly during the past 200 years. Renewable resources such as the forests, the soils, the lakes, the flora and fauna need constant vigilance in order to protect them from man-made disturbances. Indeed, man's survival, through the centuries to come, is closely bound up with their preservation. Note too the ethical implications. While many people, perhaps numbered in the millions, from all over the world, have expressed concern, on ethical grounds, regarding the long-term disposal of spent nuclear fuels, probably far fewer people are

concerned, on ethical grounds, with the use of class 1 and class 2 land for non-agricultural purposes; especially when what is being done is often irreversible. A recognition that man himself is inevitably a part of the earth's ecological system would be a good starting point in the educational process.

Two quotations from Max Dunbar's delightful monograph "Environment and Good Sense" published by the McGill-Queen's University Press, relate and appeal:

"As he grew in technological invention, and especially with the development of agriculture, man altered his surroundings progressively, cutting back the forest, ploughing, grazing cattle, sometimes destroying, always modifying, so that much of our landscape is man-made, far from the original condition."

And secondly,

"Irreparable damage to the soil is widespread, millions of tons of rich top soil have been drained down to the sea..."

There is an important trade-off involved in considerations relating to land use. On one hand there is the policy predicated on the preservation of food lands and the move of an increasing number of the population to low quality agricultural land - this policy gives rise to a trend towards increased growth of population because of increased food supplies. While on the other hand there is the policy which does not discourage the continuing encroachment of human settlements on high quality food lands - this policy gives rise to the inevitable consequence of smaller food supply and a reduced rate of growth of population. Will preservation of the food lands become part of the value system of Ontarian society (and indeed world society)? This is a philosophical issue of profound significance.

Electric power planning for Ontario is clearly related intimately to both "land use planning" and to "water use planning". As we have indicated in previous issue papers all Ontario Hydro's existing and planned thermal generating stations require prodigious quantities of water for cooling purposes. It is for this reason that these stations are sited on the shores of the Great Lakes. It has been pointed out, for example, that this plentiful supply of cooling water is, in a real sense, equivalent to a supplementary supply of fuel (the lower the temperature of the condenser coolant the more efficient the generating station). Also mentioned in Issue Paper #3 was the fact that if a thermal station is located a considerable distance from an adequate water supply (i.e., adequate for "once-through cooling") then the alternative cooling methods predicated on cooling towers, or cooling ponds, involve appreciably higher capital costs. On the other hand, if these increased costs are acceptable, the siting of thermal generating stations would lend itself to appreciably more flexibility - for example, it is highly probable that non-agricultural land would be chosen. It has been argued that the siting of potential industrial parks in Ontario, which would probably incorporate a thermal generating station, might conceivably be located in non-agricultural areas which may be situated far away (i.e., 100 miles or more) from, for example, the Great Lakes or a major river. It is probable that this planning concept will be considered during the debate stage of the Commission's inquiry.

The choice of suitable locations for electric power facilities involves a large number of considerations - many of the

related criteria have been introduced in previous issue papers.

Some of the land use considerations are:

- i) Is suitable land available, or can it be acquired, for the siting of future generating stations together with the associated land requirements for transmission corridors? If alternative generating technologies, e.g., based on solar power and wind power, are to be introduced at some future date appropriate siting criteria will have to be developed.
- ii) During the construction phase of some large-scale electric power facilities, (e.g., major thermal generating stations) additional school accommodation, health facilities and other institutional facilities will be required, and will involve land use reasonably adjacent to the facility under construction, as will the construction of transportation facilities of various kinds.
- iii) There are generally environmental and sometimes health implications associated with land use for electric power facilities - central among which is the need for minimum disturbance of the natural ecosystems - these have to be taken into account in the planning process and often involve public participation.
- iv) After completion of electric power facilities there is the question of the multi-purpose uses of adjacent land - e.g., use for agriculture, for home gardens, for recreation, etc.

The considerations outlined above constitute merely a sample of the many factors which must be taken into consideration in planning electric power facilities. At least they give a general idea of the extreme complexity of the problem.

In Issue Paper #2 we introduced the demographic factors which influence the demand for electric power. Concomitantly, of course, they also influence the use of land for habitation, industry, etc. Indeed, the growth of population is obviously the key factor in the increasing need for food although rising standards of living must also be taken into account.

Since an increasing proportion of the population in Ontario appears to reside in metropolitan, or at any rate, urbanized regions, the need for an integrated approach to land use with special attention being paid to such factors as:

- (a) The provision of food and water
- (b) The supply of energy
- (c) Education and health delivery
- (d) Transportation
- (e) Disposal of solid and fluid wastes
- (f) Pollution control measures

has been emphasized. On many occasions the land and water use implications will be clear.

The future population of Ontario will be determined not only by future birth and death rates, but also by the trends in immigration and migration. If the province, especially the southwestern region, is to be settled more densely the land use implications will be considerable. It is a salutary thought that 90 per cent of the population of Canada occupies 7 per cent of the nation's land area i.e., 270,000 square miles. This area is larger than that of the United Kingdom, West Germany, Switzerland and the Benelux countries combined. And these countries, with approximately the same living standards as Canadians, have an aggregate population of about 150 million which is, of course, 7 times greater than the population of this country. On the other hand the density of population in southwestern Ontario compares favourably with that in many other industrialized countries.

In presenting this background to the land use issues we have concentrated more on the food land implications than on other areas such as future trends in housing (low-density housing which leads to increasing waste in land resources and energy will probably be subjected to critical study), to the use of land for forestry, to the use of land for mining and to the use of land for industrial and commercial purposes - all these have important implications in electric power planning. Nor have we mentioned the north country and the importance of the wise utilization of land in this vast area - for instance, although the eco-systems of Northern Ontario are appreciably simpler than those of the southern part of the province it is important to note that, in consequence of this, the north country is more sensitive to pollutants and to environmental disturbances - there is a kind of "knife-edge balance" involved.

But the emphasis on the agricultural aspects of land use is due essentially to the major role which the farming communities of southwestern Ontario have played in the Commission's hearings to date - the logical and impressive articulation of the major issues by the agriculture-oriented interest groups, and by individual farmers and their families, is reflected in the following sections of this paper. The issues have been classified under the headings - land capability; land use patterns; and Ontario Hydro facilities.

"Every state has the right to plan and regulate the use of land, which is one of its most important resources, in such a way that the growth of population centres both urban and rural are based on a comprehensive land use plan."

Draft Declaration of Principles; United Nations, Habitat Conference June 1976.

I. Land Capability

The term "land capability" is difficult to define because its definition depends on the answer to the question - capability for what? Standard usage of the term applies essentially to the "capability of land for supporting agricultural activities - the growing of crops and the rearing of animals and birds". In this paper, as exemplified in the Introduction, we are interpreting land use and hence "land capability" in a somewhat broader sense. The question to be addressed in this section is - to what extent is land capability degraded or enhanced by electric power developments and associated factors? Whatever the specific type of land use, it is meaningful to talk about "quality of land" in the sense that the higher the quality of the land the more versatile the potential utilization of the land. (It is important to note, however, that in general the "cost" of land and its "quality" are neither equivalent nor comparable.) Accordingly, Class 1 agricultural land (see Appendix D), if readily accessible and available, can be used for growing many high protein crops, for miscellaneous farming activities, for housing, for industrial purposes, and so on, while, on the other hand, Class 7 land, say, has scarcely any agricultural use, perhaps little use for forestry, and its other uses, depending on its location, may be strictly limited. If the land is poorly drained, or if it has suffered badly from erosion, or if a higher than average level of radioactivity exists, or if its sub-surface is very rocky, etc. there might be difficulty in using the land for any productive purpose except, a very important exception, for electric power corridors, or multi-purpose utility corridors, or

for highways, etc.

There is an interesting, and enlightening, analogy between "quality of land" and "quality of energy". As we have already noted, if land classification is predicated solely on agricultural potential its classification is readily degradable by the works of man (e.g., building a shopping centre on Class 1 land probably reduces the agricultural potential of the land to zero for at least several decades). Analogously, as noted in Issue Paper #2, the "quality of energy" is also readily (unfortunately!) degradable. For instance, electricity is high quality energy because of its ready convertibility to other forms e.g., chemical energy, mechanical (kinetic) energy, and thermal energy. Again, as in the case of land degradation, energy degradation is irreversible in a "conservative system" in which exogenous energy sources are not available.

When we talk about land capability, therefore, we must bear in mind "land versatility" just as when we talk about an energy source we must bear in mind its "energy versatility". We can carry the analogy further by reflecting on "land conservation" and "energy conservation", and further still by thinking of land as a source of energy just as much as gasoline, coal, and uranium are sources of energy. Sometimes parallels of this kind are enlightening especially in developing papers such as this. They involve "metaphoric" thinking, and since metaphor is the basis of all poetry and of all science and, in some respects of life itself, it is a very powerful thought process as well as a very powerful aid to communication and understanding.

During the past few decades there have been marked changes in land use and indeed in land capability, notably in agriculture. For example, we have been told that 30 years ago each farmer produced enough to feed himself and twelve other people; today, each farmer apparently produces enough to feed himself and up to fifty other people. In large measure this has been due to advances in agricultural technology as well as to the availability of special purpose fertilizers. Furthermore, largely as a result of cooperation between the federal and provincial governments, land capability for agriculture, forestry, wildlife and outdoor recreation has been embodied in the Canada Land Inventory. An explanation of the various classifications, with an accompanying chart and a table which gives the performance indices for soil classes 1 to 4 is included in Appendix D. Also included in this appendix are the definitions, prepared by the Ontario Ministry of Agriculture and Food, which relate to prime agricultural land. Maps 1 and 2 provide a visual perspective.

Land capability is obviously a subject of considerable complexity and one which does not lend itself to superficial treatment. Nevertheless, it is justifiable to mention certain basic issues which have electric power planning land use implications.

- from the standpoint of electric power planning how adequate is the existing Land Inventory?

To what extent might it be supplemented by the identification of regions requiring special attention (e.g., resources-rich regions, regions with special ecological characteristics, key transportation centres, etc.)?

- to what extent might land capability, especially from an agricultural point of view, be enhanced by the utilization of

the "lost thermal energy" from thermal generating stations? This issue relates to the facilitation of food production using the technique used in West Germany (i.e., pipes carrying hot water buried under the cultivated surface) or by heating green houses with the "lost thermal energy" - note that these techniques lend themselves particularly to generating station "cooling tower" systems. This issue is related, of course, to the issue of the viability of "district heating" systems as mentioned in Issue Paper #3.

- in view of Ontario's special position regarding forestry and forestry products, and bearing in mind the potential of biomass energy, would a "Forestry Land Inventory" be worth developing? What about the potential of some of Ontario's forest lands for the growing of "fast growing trees" (e.g., certain hybrid fast growing trees have been developed in Finland)? The encouragement of a "wood lot" attitude appears to meet the approval of everybody!
- in some areas of the province, notably the Niagara Fruit Belt, the conflict between the use of land for fruit-growing on one hand, and its use for urban development on the other is particularly marked. To what extent, if at all, is this controversy, and similar situations indirectly related to electric power planning resolvable?

II. Land Use Patterns

As mentioned in the Introduction man uses land essentially for habitation, industry, agriculture, transportation, recreation and a variety of services (e.g., pipelines, sewage systems, water systems, generating stations, transmission lines, etc.). None of these uses for land can be planned in isolation from the others - the planning processes involved in each sector necessitate an in-depth perception of the multiplicity of interactions and interdependencies which characterize all societal systems and all complex technological systems (in the latter connection Issue Paper #7 will consider the topic in detail).

Ontario's population is distributed unevenly throughout the province essentially for geographic reasons - we note, in particular, that the physical geography of the province divides it

into two major regions which can be conveniently designated as northern and southern Ontario respectively. The northern part of the province is sparsely settled because of the severe winter climate and because of the physical nature of the land (the Canadian Shield); in this part of the province rich mineral and forestry resources are concentrated. Because of its comparatively temperate climate, and comparatively high proportion of good quality land, the southern half of the province is well suited to the growing of a wide range of crops and the rearing of cattle, hogs, sheep, poultry, etc.

The provincial population is largely concentrated on the shores of the Great Lakes - the original settlements were established on prime agricultural land and the process of urbanization has used up large areas of class 1 and class 2 land. This encroachment continues. Some of the most critical issues, with respect to land, within or closely adjacent to urban areas, arise because both industry and urban developers have been in a position to compete very effectively for land in the open market. The significance of this trend is being critically assessed; for example, it has been suggested that the proper use for land should not only take into account economic use for land factors but in addition should give adequate weight to social, environmental, ethical and aesthetic factors.

There is a vast area of Ontario's land (almost 90 per cent of the province) which is designated as public land or which is owned by government (both provincial and, on a much smaller scale, federal). This includes dedicated areas such as Algonquin and

Quetico Provincial Parks and the Niagara Escarpment - these lands are now closed to all development. The Ontario Ministry of Natural Resources manages the province's "crown lands", and guidelines for their use have been established. Most of this land is in northern Ontario; it is used largely for recreation, forestry and mining. Special land use arrangements, generally referred to as easements, allow surface rights for such purposes as pipelines, electric power lines, railways, and roads.

Ontario's forests have played, and are playing, a leading role in supporting the national and provincial economies. As a renewable resource, possibly a renewable energy resource, they are particularly significant. More land supports the growth of trees than is used for any other purpose and much of this land is better suited to forestry than to any other use. It is important to note also that the forests are essential for protecting water-sheds and for the maintenance of fish and wildlife habitats, and hence they contribute to outdoor recreational activities.

In view of the potential increasing world needs for timber and other forest products, of which pulp is very important, and the utilization of "wastes" as a source of energy as well as the whole concept of biomass, it is important to ensure that electric power planning takes full account of this basic land use. The world's supply of oxygen is to a significant extent predicated on the world's forests.

An energy strategy partly based on biomass may be feasible - it is interesting to note that in at least one country, Brazil, a major programme is in hand which involves the conversion of sugar

cane and other vegetation into alcohol and the latter's use as a fuel. The Commission has received little information concerning the potential of such techniques in Ontario.

While there are competing pressures for the use of land in Ontario, there are some situations which make the land unique and hence the competition is more keenly felt. One is the use of land adjacent to water bodies, especially the Great Lakes, where the competing uses are for:

- (a) port and docking facilities,
- (b) recreational facilities (marinas, etc.),
- (c) sites for generating stations,
- (d) sites for urban communities, industrial development, etc.

A second area of high interest is the land at the interfaces between high density urban communities and agricultural land or recreational green spaces.

During the post-World War II period most industrial nations have experienced a move of populations from rural to urban areas. Ontario is no exception. In 1951, 73 per cent of the population of the province was urban, while by 1971 this percentage had increased to 82 per cent. The expectation is that during the next 25 years the trend will continue and may even accelerate. Indeed, some provincial planners have forecast that by the end of the century the Central Ontario Lakeshore Urban Complex (COLUC) which includes Metropolitan Toronto and the regional municipalities of Hamilton-Wentworth, Halton, Peel, York, and Durham, will contain eight urban centres each with a population exceeding 500,000. We have

identified the following issues which relate specifically to land use patterns:

- should regional planning continue to be predicated, as in the past, on a continuing concentration of population and economic activity in southern Ontario where energy is most readily available?
- what, if any, regulatory processes should be established to limit the extent to which prime agricultural land, especially class 1 and class 2, will be lost because of population pressures especially for housing, industry, commerce, roads, etc.?
- it has been shown that low density housing leads inevitably to waste of land resources as well as of energy. In view of the implications for electric power planning should some regulatory measures be established?
- the land use patterns associated with road and rail transportation on one hand and with oil and natural gas pipelines, and electric power transmission corridors on the other, suggest the need for a more integrated approach to these land uses than in the past. How can this most effectively be undertaken?

III. Land Use Planning in Ontario

To put land use planning in Ontario into a simple perspective we have introduced below a brief sketch of the relevant legislation which has been enacted, together with some notes on a major government policy statement ("Design for Development") published in 1966. The latter outlines some major planning policies for the province and includes, in particular, emphasis on the need for provincial direction in regional land use.

a) Legislation and guidelines for policies

The first land-mark legislation, to deal with land use, was the Planning Act of 1946 which provided for land use planning at the local level and which assisted the

municipalities in developing the necessary guidelines. By the 1960's it was realized that the provincial government would have to assume a major role in planning in order to cope with the increasing urbanization, and with the alleviation of economic and social inequities which had developed in the province. It was essentially this situation which encouraged the government to prepare, in 1966, the "Design for Development" policy statement referred to previously. The second major piece of legislation, relating to land use, was the Ontario Planning and Development Act which was enacted in 1973 and which provided a statutory basis for provincial planning. An important purpose of this legislation was to complement and to reinforce the Municipal Official Plans and By-Laws which had been passed under the Planning Act, and in doing so to facilitate the "orderly growth" of the province.

To date the land use planning programme has been based on the 1966 policy statement. In particular, there has been special recognition of the need to control random urban development, the need to protect unique natural features such as the Niagara Escarpment, and the need for adequate structuring of the urban belt or Toronto Centred region.

As outlined in a provincial government statement entitled "Ontario's Future: Trends and Options", dated March 1976 (Ministry of Treasury, Economics and Intergovernmental Affairs), the province sees its policy objectives as:

- "To reduce disparities among the various regions of Ontario in prosperity and access to services; and to achieve a more even distribution of growth across the province;
- To correct, using regional economic and social development, specific problems in the several regions, such as those arising from too narrow an economic base; to encourage each region to realize its optimum economic potential; where necessary to broaden the range of employment opportunities in regions and localities; and to maintain a minimum standard of convenience and amenity throughout all regions by improving the level of services and access to recreation where necessary;
- To protect and husband the natural resources of the province; and to ensure good management of the rural and forest environments;
- To encourage planning for the distribution of population growth and urban development so as to ensure that the people of the province will be served by an efficient urban system; to avoid the problems of excessively rapid urban growth; and to achieve healthy, attractive urban communities."

Specially relevant to the issue of the protection of high quality farmland is a policy statement, also issued in March 1976, by the Ontario Ministry of Agriculture and Food - "Strategy for Ontario Farmland". The following quote from this statement indicates the importance which the Ministry attaches to this issue:

"...measures to ensure that within any area the better land is kept for agricultural purposes and programs to ensure the economic feasibility of using the best land for agricultural production. The Foodland Development Branch has been set up within the Ministry of Agriculture and Food to work with local government in planning for ongoing agriculture, to monitor the use of foodland, to comment on new plans and projects, and to develop policy recommendations for the preservation of agricultural land."

b) Responsibility at municipal levels

The Planning Act sets out in detail the authority vested in municipalities in connection with land use planning; for

instance, the normal procedure is for the municipalities to prepare their "official plans", which include the plans for services such as water, sewage, electric power, etc. Insofar as the distribution of electric power is concerned, the Public Utility Commission prepares the necessary plans in cooperation with other local government agencies. However, if Ontario Hydro proposes to locate a major facility (e.g., a generating station, a switching station, or a transmission line corridor) within the boundaries of a municipality, and if this is not included in the "official plan", special representations must be made to obtain an appropriate amendment to the plan or to a zoning by-law. If approval for the project is not forthcoming Ontario Hydro has recourse to the Ontario Municipal Board.

Insofar as electric power planning in general is concerned, the basic land requirements must be considered in conjunction with requirements for housing, industry, transportation, commerce and recreation.

The Commission has been presented with two points of view relating to the role of electric power planning in urban planning at the municipal level. On one hand it has been suggested that electric power planning should be used as a means of facilitating growth in some areas and inhibiting it in others, while on the other hand it has been argued that such an overt approach to regional and municipal development would be undesirable. This is a complex area, made the more

so because of the lengthy lead times involved in constructing electric power facilities. However the Commission would welcome the views of the municipalities on this issue.

c) Responsibility at the provincial level

With few exceptions, for example, land owned by the Federal Government, the overall responsibility for land use in the province rests with the Government of Ontario. The conflicting requirements (introduced earlier in this paper) of, on one hand, protecting farmland and, on the other, the provision of land for housing, industry, commerce (not least because of the basic need to provide jobs), and for services on an ever increasing scale, because of the increasing population, constitute a major dilemma for government. A well recognized need, which was referred to several times during the Commission's hearings, is for the development of comprehensive provincial land use policies, provincial energy policies and provincial development policies as an integrated whole.

In the area of land use planning, the Provincial Secretary for Resources Development, through a land use committee coordinates the policies of various Ministries with responsibilities in the area of land use. The ministries most obviously concerned are those of Agriculture and Food, Environment, Housing, Natural Resources, Transportation and Communications, and Treasury, Economics and Intergovernmental Affairs.

As a step towards moderating population pressures, especially in the "golden horseshoe area" (Oshawa, Toronto, Hamilton), it has been suggested that a major proportion of the growth in population should be diverted, if possible, to other cities and regions of the province. For example, the provincial government document "Ontario's Future: Trends and Options", prepared by the Ministry of Treasury, Economics and Intergovernmental Affairs, March 1976, referred to earlier, outlines an urban system concept and identifies six urban areas which are expected to develop. Map #3, included in Appendix D, shows the suggested major regional centres. Apart from Toronto (whose growth is expected to continue albeit at a reduced rate), four cities are tentatively identified for this role; London, Kingston, Ottawa, and Thunder Bay. The sixth urban area would be located in northeastern Ontario; however, a single regional centre has not been identified although Sudbury appears to be the appropriate city. Note that the other centres, indicated on Map #3, are also expected to grow at a rate somewhat above the average growth rate of the province as a whole. In planning the provincial electric power system it is clear that the identification of future load centres is a key requirement; tentative plans, such as those mentioned above, provide a basis upon which the associated land use planning might be developed.

Many potential mechanisms for coordinating planning were described at the Commission's hearings. For example: the Ministry of Natural Resources discussed the mechanism of a Strategic Land

Use Plan exercise as a means of determining the best allocation of land amongst a variety of uses. In the Plan, the Ministry initially develops policies with respect to land use for a particular area incorporating the priorities that other ministries see for the land. The public is then consulted and the Ministry attempts to resolve some of the conflicts thus providing initiative for planning at the Ministry level.

The Ministry of Housing, on the other hand, in considering the organizational structure that might be necessary to implement a "district heating" concept in community planning, illustrated the potential for incorporating the consideration of energy sources into planning by means of the official plan of municipal councils. Questions thus suggested:

- might the Ministry of Energy or other Ministries become active under the Planning Act with the Planning Board in considering energy requirements for official plans?

And where, for example, the Planning Act provides,

- a) for the Minister of Housing, in reviewing a draft plan for a subdivision to consider among other things, the suitability of land for the purposes planned, conservation of natural resources and the adequacy of utilities; and
 - b) for every Planning Board to hold public meetings, publish information and consult with any local boards,
- might the formulation of the municipal official plans provide a most appropriate mechanism for incorporating local/regional and provincial government concerns?

In another example, the Ministry of Agriculture and Food, while involved in developing "guidelines" for municipalities relating to official plans, does not specifically have a legislative base to administer. The Ministry noted, rather, that maintaining the agricultural community is ultimately a local

responsibility while evaluation of major projects remains the task of the Environmental Assessment Board aided by a prepared list of agricultural requirements and information.

Finally, the concept of a "combined energy centre" was presented by the Ministry of Industry and Tourism providing as an example of advanced planning, in the early design stages of Ontario Hydro planning the development of a complex of compatible industries and related communities surrounding a thermal generating plant.

Because of the different levels and branches of government involved in these planning processes, it is important to ask:

- how can jurisdictional problems be minimized? What structuring of planning groups is necessary with respect to central and regional offices of government, different levels of government, or different ministries?

Integrated planning could also streamline the collection and interpretation of data on land use and environmental impact information. While the "energy management resource centre" established by the Ministry of Agriculture and Food provides specialized information to the farming public, an over-all coordination of information would be beneficial to all government agencies. Issues include:

- how can information gathered by Ontario Hydro be presented in a form usable by other planning agencies and ministries (and vice-versa)?
- what types of energy-related research studies should reside within the different ministries? Do these ministries currently have the capacity for this research? Who could coordinate this work?

- to what extent might research in the private sector be encouraged or contracted out by ministries or agencies and subsequently be shared?

IV. Ontario Hydro's Facilities - Land Use Aspects

As the province continues to grow, the need for major installations (e.g., electric power stations), and the connecting links between them and between urban centres increases. Indeed, the networks of transmission lines are evidence of the proliferation of these services across the province and, incidentally, evidence of the increasing interdependence of each of our lives. (See also Issue Paper #7, "The Total Electric Power System of Ontario".) In this section the land use aspects of the province's electric power system, and the issues associated with them, are introduced.

The first step in electric power planning is the forecasting of the magnitude and location of the demand on the system. A subsequent step is the development of plans for new facilities, i.e., generating stations, switching stations, and transmission lines to meet this demand. These plans are discussed with provincial and municipal governments, with the landowners who will be affected, and with the public at open meetings. During the public meetings the land use aspects of Ontario Hydro's proposals together with the environmental implications are usually the major topics under discussion. As far as the environmental impact of the proposed facilities are concerned, it is virtually certain that these will subsequently be considered in depth in public hearings conducted by the Ontario Environmental Assessment Board.

The losses of farmland attributable to electric power generation and transmission facilities, per se, are relatively small especially in comparison with the impact of urbanization. (In Table I, Appendix D, we have indicated the comparative acreages involved in several major activities and facilities.) However, concern has been expressed in connection with the actual location and siting of some of these facilities. The major siting criteria for generating stations and transmission lines are outlined in Issue Papers #1 and #3 (for generating stations) and Issue Paper #4 (for transmission corridors).

One of the key pieces of legislation which applies to the process of land acquisition, for the provision of certain services and which applies to Ontario Hydro's acquisition of land, is the Expropriations Act. This legislation is designed to protect both the interests of the property-owner and that of the body seeking expropriation. The Minister of Energy is the designated authority to whom applications are made and who ultimately makes the appropriate decisions. In some cases the Minister may authorize public hearings. There are, however, some aspects of the process of land acquisition which continue to give cause for concern. Consider, for example, the case of the farmer intending to retire within two or three years and expecting that a major portion of his retirement income will derive from the sale of all or part of his property for development or to another farmer. He will argue that transmission lines across his property will lower its value and hence will decrease his retirement income. Such cases are not uncommon and may call for special treatment. This is a land use

issue which deserves detailed consideration to ensure that each affected farmer will be treated as fairly as possible.

While electrical energy planning involves two potentially integrative concerns - energy policy and land use planning, Ontario Hydro's public participation program to date has been largely concerned with involving other parties in the land use planning aspect. In this planning, provincial government ministries and municipal officials have been involved on external teams both as sources of information and facilitators for incorporating regulatory requirements into the planning process at an early stage. Within this context, the broad issues noted at the Commission hearings include:

- to what extent are the ministries and municipal officials involved in the overall land use planning strategy developed by Ontario Hydro?
- what impact does the contribution of the ministries have on the ultimate conclusion of the discussions? (i.e., have significant numbers of conclusions been altered as a result of ministerial input on external teams?)
- what mechanisms might best incorporate electrical energy supply factors into local, regional and provincial plans (or might best incorporate local/regional/provincial concerns into power system planning?

a) Location of generating stations

The use of a site for a power plant limits but does not necessarily preclude other land uses. Consider, for example, hydroelectric and nuclear power generating plants respectively. In the case of hydroelectric plants they might improve public water supplies, facilitate flood control and may provide certain recreational facilities. Similarly, in the case of nuclear power stations, the major part of the

designated area can be used for housing, agriculture, recreation, etc. But note that the Atomic Energy Control Board siting regulations require an exclusion zone around a nuclear reactor and specific limits are set to the numbers of people living in the area. The inner core area of about 1 square mile, in which the nuclear station is situated, is necessarily an "exclusion zone". One potential problem relating to the use of land closely adjacent to a nuclear power station is the increasing need to ensure stringent security regulations to prevent acts of sabotage.

What areas are available in the province for large generating stations? According to Professor Norman Pearson (see Research Report for the Food Land Steering Committee - "Food Land and Energy Planning") the only areas now available for large-scale thermal generating stations are:

- i) Large publicly owned land;
- ii) Existing generating station sites which have reserved land capacity (e.g., the following sites appear to qualify - Bruce, Pickering, Nanticoke, Lambton, and Lennox);
- iii) Sites in high intensity farming areas;
- iv) Sites in high intensity forestry areas;
- v) Sites in unexploited forest areas;
- vi) Sites in recreational areas

We have already alluded to the potential use of generating stations in a dual-purpose capacity i.e., thermal energy generation and electric power generation. Furthermore, the possibility of energy centres being

developed in which various industries might be located in the vicinity of a thermal generating station, so that process steam, space-heating and electric power might be provided with a high level of efficiency, has been mentioned in previous papers. The land use implications of such so-called "industrial parks" might be appreciable. For example, there would probably be determined efforts to ensure that the parks would not occupy class 1 and 2 farmland, and the preferred locations would probably be where the agricultural potential is low. However, there are many considerations which would have to be taken into account, most of which are beyond the scope of this paper.

The major issues which relate to the siting of generating stations have already been identified in Issue Paper #3. It remains in this paper to stress the issues:

- to what extent might bulk pricing strategies be designed to encourage the development of industrial parks in non-agricultural areas?
- from the standpoint of conserving high quality farmland, as well as from other standpoints, would several small decentralized power stations be preferable to a single large power station? Such considerations as system reliability, capital costs, operating costs, environmental impacts, etc., would have to be taken into account.

b) Location of transmission lines and switching stations

The location of electric power transmission lines is determined basically by first the locations of the generating stations and switching stations in the electric power system, and secondly by the locations of the consumers. In general, the greater the electric load on the system and the more widely dispersed the load centres, the more transmission lines are required and concomitantly the more land is needed for "transmission corridors". It is important to note that from the important viewpoint of minimizing energy losses (i.e., practising the principles of energy conservation!) the shorter the transmission line, between a generating station and a major load centre, the better because the energy losses in the form of thermal energy are smaller. Quite simply, if electric power is transmitted from point A to point B, the energy losses, everything else being equal, are minimized when the transmission line is a straight line between A and B (recall the theorem in geometry which states that the shortest distance between two points is the length of the straight line joining them!). But clearly many other factors must be taken into account and the "ideal" solution is often not a practical solution because it does not take into account the nature of the land, which may be densely populated, or class 1 farmland, or very hilly, etc.

It is also important to consider both the short-term and the long-term impacts of a transmission line on land use. In the short-term, when the line is being constructed, there are

significant impacts such as loss of crop production and perhaps appreciable inconvenience, while the long-term impacts on farmland, due to the towers, are usually interference with ploughing, sowing seeds, and harvesting operations.

If underground cables were to become economically viable, the land use impact, as compared with the conventional overhead transmission lines, would almost certainly be appreciably less. Certainly from an aesthetic point of view the underground cable would have a great deal to commend it. There are problems, however, which relate to the compacting of the soil and the loss of top-soil, and problems of insulation breakdown and other faults. Maintenance procedures would also cause inconvenience to the farmer or land-owner. Reference should be made to Issue Paper #4, and particularly to Dr. O.M. Solandt's Ivey Paper, "Bulk Transmission of Electric Power" which was published recently.

The basic land use issues which relate to transmission lines, as well as, in some respects, to switching stations might be summarized as:

- to what extent can the routing of transmission lines (and the locating of switching stations) be carried out so as to minimize the impact on, for example, farmland, without unduly increasing costs? To what extent is it feasible to use, where appropriate, concession roads or lot lines where the impact on farmlands would be minimized?
- although it has been stated by authorities, such as Professor Norman Pearson, that the loss of agricultural land due to transmission lines, in the province, is a very small percentage of the total land available, there is nevertheless a feeling in the agricultural community that extra high voltage transmission lines constitute a

major threat to Ontario's farmlands (not only from the standpoint of land use, per se, but also on health, environmental and economic grounds). How can this conflict of interest be resolved? How should these various factors be weighed in considering the overall impact of transmission lines on agriculture?

- assuming that the technology of underground cables will develop, during the next decade or two, to such an extent that the cables become economically viable (say by the end of the century) what are the land use implications? Would underground cables be more acceptable to the farming community than the existing conventional overhead transmission lines and towers?

Postscript

At the time this Issue Paper was "going to press" the Ministry of Agriculture and Food published a paper entitled "A Green Paper on Planning for Agriculture - Food Land Guidelines". This paper is clearly relevant to the Commission's work, especially since some of the guidelines relate specifically to electric power systems. No doubt these will be considered, together with the issues raised in this paper, during the debate stage of the Commission's inquiry.

It has also been brought to our attention that a Forest Resources Inventory for Ontario is already available. It includes data on the age, species, geographic areas of production, and an estimate of volume of known yields per acre. The issue introduced on page 14 goes rather beyond this and refers in particular to potential areas for forest production for biomass purposes.

APPENDICES

Appendices A, B, and C provide a sample of the comments relating to Land Use which were made during the preliminary public meetings and the public information hearings, together with references to the subject in the research and background papers prepared for the Commission. Appendix D contains tables, maps, and some data concerning land classification and land use in Ontario.

More detailed information on the Land Use issues is contained in the transcripts and memoranda for public viewing in the Commission's Information Centre, 14 Carlton St., Toronto, Ontario, M5B 1K5 and in the Regional Depositories located in the Main Libraries in Thunder Bay, Sudbury, London and Ottawa. The research documents are only available at the Commission's Information Centre in Toronto.

APPENDIX A

REFERENCES TO LAND USE

AT THE PRELIMINARY HEARINGS

I. LAND CAPABILITY

"It is therefore proposed that steps be taken to obtain clear and unambiguous answers to these questions:

1. Inventory of food land resources. This is divided into several sub headings:
 - (a) How much productive food land have we?
 - (b) What is the present rate of wastage and disappearance?
 - (c) To what non-agricultural uses is it being put?
 - (d) Of the quality food land in inventory:
 - (i) How much is climatically suited for various crops, for example: pasture and animal roughage, cereal grains, vegetables, fruit, etc? This kind of designation is what we are looking at.
 - (ii) What are the production costs related to land class and location?"

S-60

"Topsoils have been built up by natural process over thousands of years and once destroyed the reconstruction of soils is difficult and uneconomical. Agriculture is tied to its soils and cannot move elsewhere. A reduction of cropland through non-agricultural development inevitably reduces the potential for food production."

S-138

"What is an acre of land worth? An acre of something that there is obviously less of each year; an acre that will produce in Ontario 90 bushels of corn or 40 bushels of wheat or 50 bushels of barley or 30 bushels of soybeans or 13 cwt. of dry beans or 2½ tons of hay, and do this not just once but with proper management could continue to produce forever. What is that acre of land worth? What is the real value to society of such a resource?"

S-141

II. LAND USE PATTERNS

"In Ontario we have failed to coordinate the use of our resources for the benefit of society. We do not have a land use policy and it is obviously needed right now and it is high time, sir, that the consumer as well as the farmer assumes responsibility for preservation of prime food lands of this Province."

S-141

"We believe that some productive use can be made of land represented by transmission line corridors."

S-28

"We would hope that the Royal Commission on Electric Power Planning will uncover the studies that are available that illustrate the causes for decreasing amounts of available prime farm land and whether this is affected most by industrial development, housing development, roads, transmission lines, generating plants or something else. We would also hope that it would illustrate what factors affect the production capacity of prime land, such as development of hybrids, new techniques, work habits and the like."

S-59

"Since agriculture must parallel growth and development of all other sectors of the economy and cannot afford any further loss of land, industrial and urban development should be directed towards areas with marginal soils in Eastern and Central Ontario and possibly in Northern Ontario.

Electrical generating facilities, which will supply the much needed power for industrial growth and will catalyze industrial and urban development, then should be directed to be built near these often as yet undeveloped areas with marginal land rather than be built in the heartland of Ontario agriculture at the expense of food production potential and to the detriment of the agricultural industry."

S-139

III. LAND USE PLANNING IN ONTARIO

"The far greater threat to agriculture, however, will come from subsequent industrial and urban development, that inevitability will take place in close proximity to the source of electric power."

S-138

"Transmission lines should be located in a corridor with other utilities, highway, railroad, telephone, natural gas line, etc. This would make them all less unsightly."

S-187

"It seems incongruous to me that we still campaign for four lane controlled access highways across our farmland and then violently protest hydro tower lines across the same type of four lanes."

S-42

"Our prime concern is whether future generating sites and transmission lines should be allowed to encroach upon the bread basket lands of this province. Must the heritage of leading food-producing lands be destroyed by the careless placement of generating stations and transmission lines."

S-137

"We can object to tower line routes across the farms: - but we must be prepared to accept the potential of restricting our economic and industrial progress."

S-42

IV. ONTARIO HYDRO'S FACILITIES - LAND USE ASPECTS

"In regards to future power generating stations and transmission corridors, it is suggested that the regional governments within Ontario be included at the conceptual stage in site selection and phasing. This inclusion will not only aid in effecting a better environment, but will also be a mechanism to help stimulate growth in depressed areas as well as curbing growth where necessary."

S-55

"Instead of running high voltage transmission lines as the crow flies to their destination; there should be an investigation into the possibility of using existing corridors such as highways, railway lines or even farmers' line fences. Practising this method of transmission would save a great deal of land which could be used for food production and it would prevent undue distress to farmers. There should also be research into the possibility of transporting high voltage power underground."

S-110

"We feel that future electric power plants and transmission lines should be built on low priority agricultural land or on non-agricultural land.

Our concerns are:

- (1) Land tax increases as higher populations will demand more services.
- (2) Increased danger of the farmer on secondary roads and highways because of increased traffic.
- (3) Higher cost and scarcity of labour.
- (4) Farm liability increases due to hydro corridors.
We feel Ontario Hydro should assume all liability for accidental damage to power lines on farm property.

- (5) Increased competition for land resulting in requests for more severances on small acreages, (i.e. for homes, trailer parks, etc.).
- (6) Inconveniences of the farmer working below and around the power lines with large equipment, aerial spraying, etc.
- (7) Availability of a large supply of electric power in Huron could cause agriculture to be secondary to large industry."

S-135

"The effects of wide transmission corridors across both valuable forest land and farm land should be examined prior to granting permission to locate a generating station a great distance from actual need."

S-342

"The transmission corridors themselves will consume food land, but the generating stations and the associated developments that they attract will consume far more."

p.2216 v. 17

APPENDIX B-1

REFERENCES TO LAND USE

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The Pesticides Act, 1973, with Regulation 618/74.

The Environmental Assessment Act, 1975

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Criteria and Guidelines - 1971. (Water Quality)

Criteria and Guidelines for Water Heat Discharge to the Great Lakes System - 1975.

Site Selection Study Guidelines for Thermal and Related Impacts
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Effluent Guidelines for Water Heat Discharge to the Great Lakes System, 1975.

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REFERENCES TO LAND USE IN OTHER SUBMISSIONS

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PUBLIC INFORMATION HEARINGS

LIST OF EXHIBITS RELEVANT TO LAND USE

TOPIC 6: TRANSMISSION ENVIRONMENTAL	
Exhibit 6-10	Composite Ranking
6-11	Constraint map ranking situations No. C1
TOPIC 7: SOCIO-ECONOMIC FACTORS	
Exhibit 7-3	Booklet "Acquiring Land for High Voltage Transmission Lines"
TOPIC 8: PROVINCIAL DEVELOPMENT AND LAND USE FACTORS	
Exhibit 8-2	Atomic Energy Control Board Siting Guidelines
8-4	Bruce Heavy Water Plant Governmental Study
8-6	Main Components of Provincial Planning System
TOPIC 9: ONTARIO MINISTRY OF AGRICULTURE AND FOOD	
Exhibit 9-2	Policy position paper: "Strategy for Ontario Farm Land"
TOPIC 12: ONTARIO MINISTRY OF THE ENVIRONMENT	
Exhibit 12-20	Site Guidelines referred to by Dr. Ian McTaggart-Cowan
TOPIC 13: ONTARIO MINISTRY OF ENERGY	
Exhibit 13-3	District Heating Study (February 1976) by Acres Shawinigan
TOPIC 14: MINISTRY OF NATURAL RESOURCES	
Exhibit 14-1	Sketch showing cross section of a typical littoral zone
TOPIC 18: ONTARIO MINISTRY OF TREASURY ECONOMICS AND INTERGOVERNMENTAL AFFAIRS	
Exhibit 18-2	A Long term projection of Ontario's industrial development pattern
TOPIC 32: FISHERIES AND ENVIRONMENT CANADA	
Exhibit 32-1	Pamphlet issued by International Joint Commission, 1974 entitled "Great Lakes Water Quality".

TOPIC 37: ONTARIO INSTITUTE OF AGROLOGISTS	
Exhibit 37-1	Norman Pearson's Study - "Food Land and Energy Planning" - Volumes I and II.
TOPIC 46: HURON POWER PLANT COMMITTEE	
Exhibit 46-3	Document entitled "The Impact of Urban and Industrial Development on Crop Production in Surrounding Areas (D.P. Ormond)
46-4	Document entitled "Preliminary estimates Huron crop acreage, production and farm value of 1975".
TOPIC 53: SCIENCE COUNCIL OF CANADA	
Exhibit 53-3	Science Council Report # 25 (July 1976) "Population, Technology and Resources".

APPENDIX C

BACKGROUND PAPERS

Electric Power Transmission, the
Technology and the Problems (Ivey Paper)
Dr. Omand Solandt

RESEARCH PAPERS

Land Use Implications of Electrical Supply
Facilities

Dr. Norman Pearson

The Role of Ontario Hydro as an Economic
Development Tool of the Province

J. O. Dean

A Study of Awareness, Attitude and Future
Expectations of Ontario Residents regarding
the supply and use of Electric Energy

Semper Paratus Ltd.

FUNDED STUDIES

Food Land Steering Committee

Research includes:

- Land use plan for the province
- Impact of large generating stations and
transmission lines on food land and the Canadian Shield
- Future food and energy needs

Christian Farmers' Federation of Ontario

Research includes:

- Effects of power lines
- Food land weighting

University of Waterloo

Research to examine some aspects of hydro-electric transmission
corridors related to impacts on the physical and human environments.

APPENDIX D

Table I

COMPARATIVE ACREAGES INVOLVED IN THE

ELECTRIC POWER BULK TRANSMISSION SYSTEM

FARM LAND, AIRPORTS, ETC.

Ontario Hydro Bulk Transmission System	180,000 acres
Mitabel Airport	88,000 acres
Ontario Government Land Freeze for Plickering Airport	85,000 acres
Toronto International Airport (Malton)	4,388 acres
Area occupied by Lakeview Generating Station	144 acres
Area occupied by Bruce N.P.D. Additional controlled area where population density is regulated	2,300 acres
Total area of Ontario excluding that covered with water	220,160,000 acres
Good farmland in Ontario	12,000,000 acres

CLASS 1 SOILS IN THIS CLASS HAVE NO SIGNIFICANT LIMITATIONS IN USE FOR CROPS.

The soils are deep, are well to imperfectly drained, hold moisture well, and in the virgin state were well supplied with plant nutrients. They can be managed and cropped without difficulty. Under good management they are moderately high to high in productivity for a wide range of field crops.

CLASS 2 SOILS IN THIS CLASS HAVE MODERATE LIMITATIONS THAT RESTRICT THE RANGE OF CROPS OR REQUIRE MODERATE CONSERVATION PRACTICES.

The soils are deep and hold moisture well. The limitations are moderate and the soils can be managed and cropped with little difficulty. Under good management they are moderately high to high in productivity for a fairly wide range of crops.

CLASS 3 SOILS IN THIS CLASS HAVE MODERATELY SEVERE LIMITATIONS THAT RESTRICT THE RANGE OF CROPS OR REQUIRE SPECIAL CONSERVATION PRACTICES.

The limitations are more severe than for Class 2 soils. They affect one or more of the following practices: timing and ease of tillage; planting and harvesting; choice of crops; and methods of conservation. Under good management they are fair to moderately high in productivity for a fair range of crops.

CLASS 4 SOILS IN THIS CLASS HAVE SEVERE LIMITATIONS THAT RESTRICT THE RANGE OF CROPS OR REQUIRE SPECIAL CONSERVATION PRACTICES, OR BOTH.

The limitations seriously affect one or more of the following practices: timing and ease of tillage; planting and harvesting; choice of crops; and methods of conservation. The soils are low to fair in productivity for a fair range of crops but may have high productivity for a specially adapted crop.

CLASS 5 SOILS IN THIS CLASS HAVE VERY SEVERE LIMITATIONS THAT RESTRICT THEIR CAPABILITY TO PRODUCING PERENNIAL FORAGE CROPS, AND IMPROVEMENT PRACTICES ARE FEASIBLE.

The limitations are so severe that the soils are not capable of use for sustained production of annual field crops. The soils are capable of producing native or tame species of perennial forage plants, and may be improved by use of farm machinery. The improvement practices may include clearing of bush, cultivation, seeding, fertilizing, or water control.

CLASS 6 SOILS IN THIS CLASS ARE CAPABLE ONLY OF PRODUCING PERENNIAL FORAGE CROPS, AND IMPROVEMENT PRACTICES ARE NOT FEASIBLE.

The soils provide some sustained grazing for farm animals, but the limitations are so severe that improvement by use of farm machinery is impractical. The terrain may be unsuitable for use of farm machinery, or the soils may not respond to improvement, or the grazing season may be very short.

CLASS 7 SOILS IN THIS CLASS HAVE NO CAPABILITY FOR ARABLE CULTURE OR PERMANENT PASTURE.

This class also includes rockland, other non-soil areas, and bodies of water too small to show on the maps.

0 ORGANIC SOILS (Not placed in capability classes).

PRIME AGRICULTURAL LAND

Prime agricultural land as defined by the Ontario Ministry of Agriculture and Food in a statement to the Planning Act

Review Committee, includes:

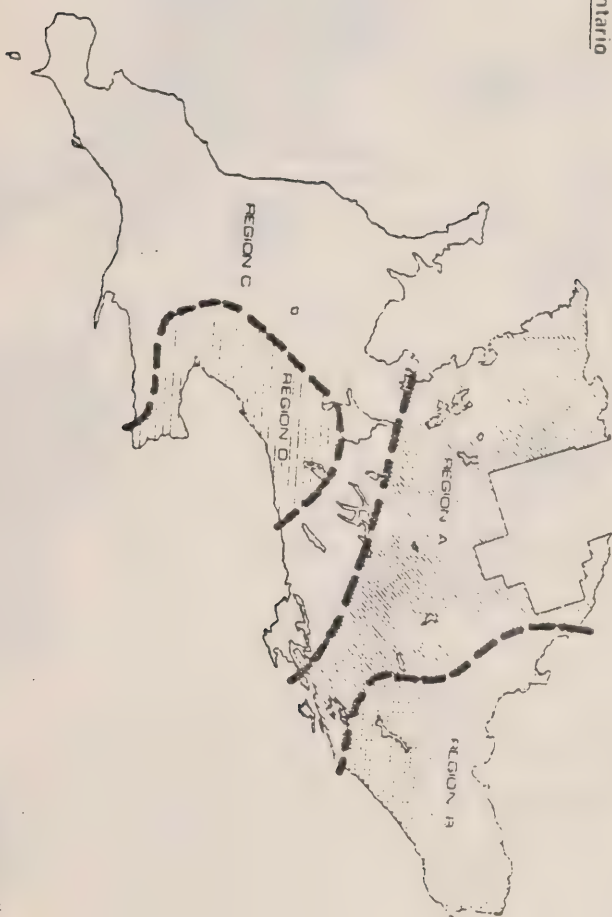
- "All lands where classes 1, 2, 3, and 4 predominate as defined in the Canada Land Inventory.
- All lands which have a high capability for the production of specialty crops due to special soils or climate.
- Areas where farms exhibit characteristics of ongoing viable agriculture.
- Areas where local market conditions ensure agricultural viability where it might not exist otherwise.
- Lands which may not have a high agricultural capability, but will serve as a buffer between livestock farming and urban development."

PERFORMANCE INDICES

From a statement entitled "The Assessment of Soil Productivity for Agriculture", Report No. 4 conducted under the Canada Land Inventory Program, ARDA, the following table gives performances indices for Soil Classes 1 to 4 for common field crops.

CLASS	INDEX	RANGE
1	1.00
2	.80	.80 ⁺ .03
3	.64	.64 ⁺ .04
4	.49	.49 ⁺ .06

- A) The Shield Area
- B) Eastern Ontario
- C) South Central and South western Ontario
- D) The "Urban Arc"



P. D. Keddie

Map 2
Prime
Agricultural
Lands

Land of High
Productivity

Land of Fair
to Moderately High
Productivity

Other Land

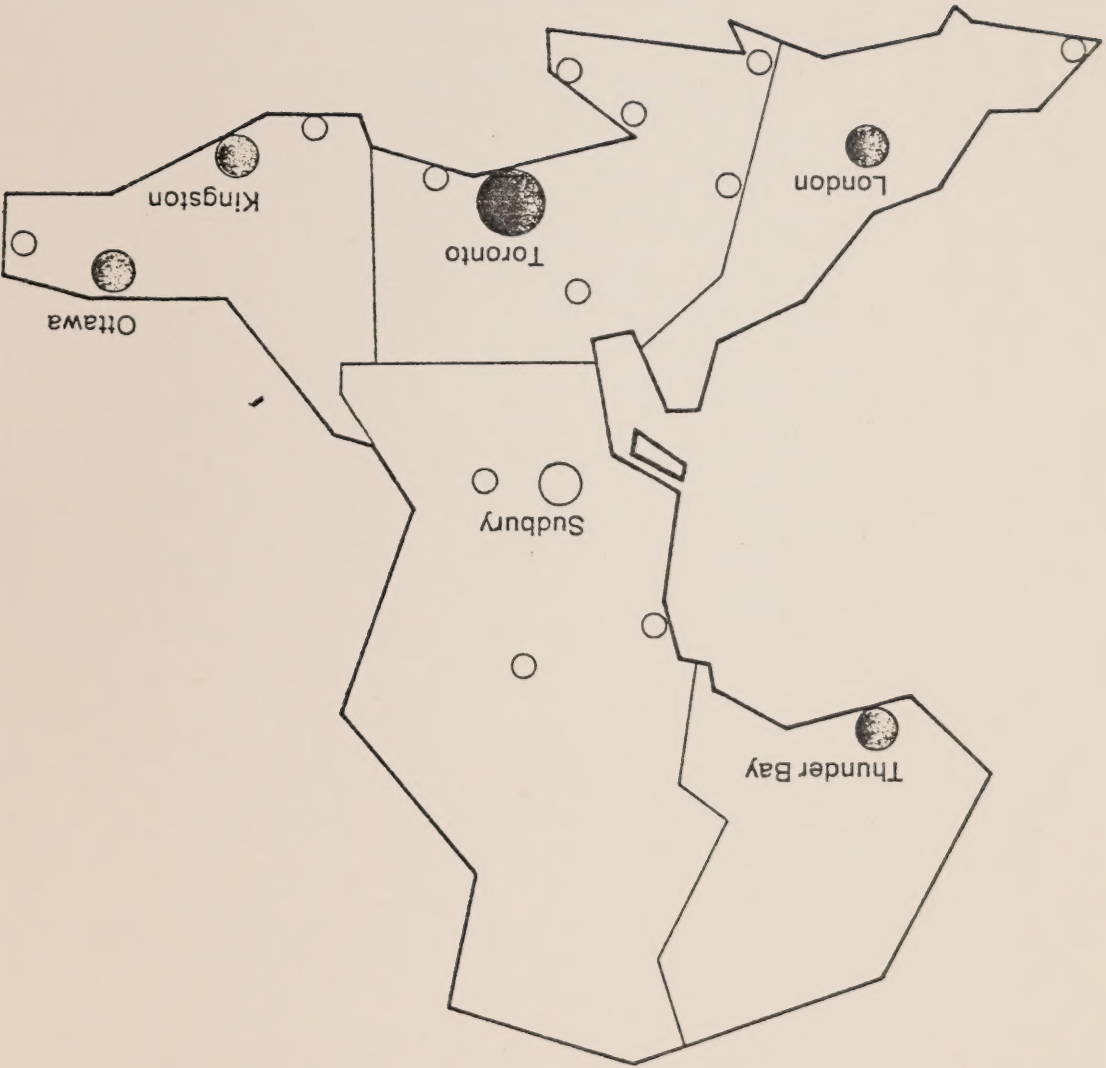


"Ontario's Future: Trends
and Options" - Ministry of
Treasury, Economics and
Intergovernmental Affairs,
March 1976.

Urban System Concept

- D.7 -

MAP 3



Provincial Centre

Preferred Major Sub-Regional Centres

"Ontario's Future: Trends and Options" - Ministry of Treasury, Economics and Intergovernmental Affairs, March 1976.

